trol group served 32 pts without AS who underwent cardiac catheterization with passage of the AV.

Results: 102 pts were randomised in group 1, 51 pts in group 2. Pts with or without retrograde catheterization of the AVdid not differ in age (71±8 versus 69±10 years), mean pressure over the AV(51 ±18 versus 48 ±15 Hg) and AVA (0.69 ± 0.20 versus 0.72 ±0.17 cm^2); whereas the incidence of cerebral embolism was significantly higher in the group with retrograde catheterization than in those pts without passage of AV(22 versus 0, p=0.0006). 3 out of 22 pts with cerebral embolism as diagnosed by MRI had a neurological deficit. In the control group neither neurological deficits nor cerebral embolism were observed.

Conclusions: Retrograde catheterization of valvular AS is associated with a considerable risk of silent (22%) and clinically apparent (3%) cerebral embolism. Pts with AS who undergo only coronary angiography have a low risk of cerebral embolism. These findings have important clinical implications for the indication of retrograde catheterization of the AV for determining the severity of stenosis.

ORAL CONTRIBUTIONS

837 Current Dilemmas in Valve Surgery

Monday, March 18, 2002, 4:00 p.m.-5:30 p.m.
Georgia World Congress Center, Room 256W

4:00 p.m.

837-1 Fate of Severe Mitral Regurgitation After Coronary Revascularization Alone

B-Khanh Lam, A. Marc Gillinov, Brian Griffin, Jeevanantham Rajeswaran, Eugene H. Blackstone, *Cleveland Clinic, Cleveland, Ohio.*

Background: Traditionally, patients (pts) with moderately severe (3+) and severe (4+) mitral regurgitation (MR) undergo concomitant repair during coronary artery bypass grafting (CABG). The objectives of this study were to 1) contrast preoperative (preop) and intropeative (inOR) MR, 2) characterize the pattern of MR postoperatively (postop), and 3) to identify predictors of postop MR severity.

Methods: From 1980 to 2000, 243 pts undergoing CABG alone had unrepaired 3+ and 4+ MR by preop angiography or transthoracic echocardiogram (TTE). Mechanism of MR was ischemia in 205 (84%) pts, degenerative in 15 (6%), rheumatic in 4 (2%) and indeterminate in 19 (8%). Right coronary artery (RCA) disease was present in 223 (92%) pts and left circumflex (LCx) disease in 188 (77%); 176 (72%) pts had prior myocardial infarction (MI), presenting acutely in 58 (25%). A total of 252 follow-up TTE were obtained from 127 (52%) pts.

Results: Pre-CABG MR, assessed in 140 (58%) pts by inOR transesophageal echocardiograms (TEE), was absent (0), mild (1+) or moderate (2+) in 119 (85%) pts and 3+ or 4+ in 21 (15%). Post-CABG MR by inOR TEE in 56 (23%) pts was 0, 1+ or 2+ in 39 (88%) and 3+ in 7 (12%). This inOR downgrading of MR led to non-repair in 155 (66%) pts; other reasons were apparent oversight in 42 (18%), discrepant preop MR grading in 34 (14%) and hemodynamic instability in 5 (2%). Analysis of follow-up TTE for MR severity over time showed that 76% of patients had 0 or 1+ MR early postop while 24% remained with a high grade of MR (3+/4+). Within the first two months, the proportion of pts with high grade (3+/4+) MR increased to 64% while that of milder MR (0/1+) decreased to 34% (P=.02). A subsequent steady state of MR was observed to 14 years. Predictors of postop MR severity included RCA (P=.01) and LCx (P=.02) disease. InOR downgrading did not predict milder MR during follow-up.

Conclusion: When inOR TEE downgrades MR, surgical decision-making should be based on preop assessment of MR. Early decreases in MR after CABG do not persist over time. High grade (3+/4+) MR is unlikely to resolve by coronary revascularization alone, particularly in patients with RCA and LCx disease.

4:15 p.m.

837-2 Should CABG Patients With Mild or Moderate Aortic Stenosis Undergo Concomitant Aortic Valve Replacement? A Decision Analysis Approach to the Surgical Dilemma

William T. Smith, IV, T. B. Ferguson, Jr., Eric D. Peterson, *Duke University Medical Center, Durham, North Carolina.*

Background: Patients who need coronary artery bypass surgery (CABG) who also have asymptomatic, mild to moderate aortic stenosis (AS) may undergo isolated CABG or concomitant CABG and aortic valve replacement (CABG/AVR). This decision should ideally be individualized based on the patient's predicted long-term outcomes with each competing surgical strategy.

Methods: We performed a Markov model decision analysis to compare the long-term quality adjusted life outcomes of patients with mild to moderate AS undergoing CABG, or CABG/AVR. Age-specific procedural morbidity and/or mortality risks with CABG, CABG/AVR, or those with AVR following a prior CABG were based on the STS National Database (N >1 million) from 1995-2000. Likelihood of progression to symptomatic AS, probabilities for valve-related morbidity (stroke and bleeding risk), and age-adjusted mortality rates were obtained from available literature.

Results: CABG mortality increased from 1.3% for patients <55 years old to 5.7% for *patients >75; CABG/AVR mortality increased* from 3.9 to 8.7%. Assuming a constant annual rate of progression of AS (7 mmHg/year), the optimal model decision was strongly affected by baseline patient age and aortic valve peak systolic gradient by echocardiography. For example, patients younger than 70 years old with a peak gradient of over 26 mmHg had a longer average life expectancy with CABG/AVR than with CABG alone. In patients over age 70, however, CABG/AVR was preferred only as the baseline aortic valve gradient increased to approximately 50 mmHg. Sensitivity analysis demonstrated that the rate of AS progression influenced outcomes. With slow progression (2 mmHg/year), CABG is favored for all ages of patients with AS gradients <50 mmHg; with rapid progression (14 mmHg/year), CABG/AVR is favored for all patients except those >80 years old with a valve gradient less than 25 mmHg.

Conclusions: This study provides clinicians with an empirical means of deciding which is the best procedure for patients with mild/moderate AS requiring bypass surgery based on their age, baseline aortic valve gradient, and rate of AS progression.

4:30 p.m.

837-3 Constrictive Pericarditis in Patients With Coronary, Valvular, or Congenital Heart Disease: Outcome of Pericardiectomy Combined With Other Cardiac Operations

David G. Cable, Hartzell V. Schaff, Thomas A. Orszulak, Jae K. Oh, Joseph A. Dearani, Charles J. Mullany, Richard C. Daly, Francisco J. Puga, Gordon K. Danielson, *Mayo Clinic and Mayo Foundation, Rochester, Minnesota.*

Background - The safety of isolated pericardiectomy has improved in recent years (mortality of 6% in our most recent review), but little is known regarding outcome of the operation when combined with other cardiac surgical procedures.

Methods - From 1972 through 2000, 50 patients (mean age 61±15 years; 39 men) with other forms of heart disease had pericardiectomy for constrictive pericarditis; all had additional procedures including CABG in 28 (43% with IMA), valvular repair or replacement in 27 (tricuspid 55%, mitral 33%, and aortic 22%), and atrial septal repair in 4 pt. The etiology of constrictive pericarditis was idiopathic in 46%, postoperative (mean interval 8.1 years) in 38%, and secondary to mediastinal radiation in 14%. Advanced congestive heart failure (48% in NYHA Class IV) was present for an average 16 months preoperatively.

Results - Nine pt died postoperatively, and the risk was independent of the etiology of constriction. Low cardiac output syndrome was the cause of death in 5 pt; hemorrhage accounted for one death. Excessive postoperative bleeding (mediastinal drainage >150cc/hr for six hours) occurred in 31% patients, and 7 pt (14%) required reoperation for bleeding. Use of antifibrinolytic agents including aprotinin did not reduce total blood transfusion requirements or transfusion of blood components. For all pt, probability of survival was 74±6% at 1 year and 53±9% at 5 years; survival was significantly reduced (P<0.001) in pt who had large transfusion requirements (≥50 units of blood and blood products, n=6). Postoperatively, 83% were in NYHA Class I or II.

Conclusions - The presence of associated cardiac disease increases morbidity and mortality of pericardiectomy for pt with constrictive pericarditis. Excessive bleeding occurs in approximately one-third of pt despite aggressive use of antifibriolytic drugs. Importantly, excessive bleeding after operation is associated with poor early and late survival.

4:45 p.m.

837-4 Echo/Doppler Evaluation of 137 Normal Aortic Allografts: Comparison With New Generation Bileaflet Mechanical and Stentless Xenograft Prostheses

Darryl J. Burstow, Raffat Shameem, Ian Smith, Joan Petch, Mark F. O'Brien, *The Prince Charles Hospital, Brisbane, Australia.*

Background: A major advantage of the normal allograft prosthesis (A Allo) is said to be superior hemodynamic performance. Recently, new generation mechanical and tissue prostheses with improved hemodynamics have become available. The aim of the current study was to establish the normal values for Doppler hemodynamic parameters for AAllo and compare findings with previously obtained data for the ATS mechanical and Cryolife O'Brien (CLOB) stentless xenograft prostheses. **Method:** Utilizing our data base, 137 patients were identified who had undergone echo/Doppler evaluation less than 12 months following AAllo implantation and had < grade 1/4 aortic regurgitation(AR). **Results:** A selection of data is provided below and is presented as median and interquartile ranges. The Mann-Whitney test was used for comparison of Doppler parameters. P value was <0.05 for all AAllo Doppler parameters compared with eqiuvalent CLOB and ATS values while p was <0.05 for all CLOB values compared with ATS except for EOA and EOA/BSA at the 27mm valve size. DPI = Dimensionless Performance Index. EOA = Effective Orifice Area. BSA = Body Surface Area. **Conclusions:** 1. This study establishes normal reference ranges for AAllo Doppler data. 2. Hemodynamic performance of AAllo is still superior to new generation mechanical and tissue prostheses.3. CLOB valve has superior hemodynamics to the ATS valve especially at the smaller valve sizes.

Doppler Parameters

Valve size/type	AAllo 23mm	CLOB 23mm	ATS 23mm	AAllo 25mm	CLOB 25mm	ATS 25mm	AAllo 27mm	CLOB 27mm	ATS 27mm
Peak velocity (V2) m/s	1.8 1.6-1.9	2.5 2.0-2.7	2.5 2.3-2.7	1.5 1.3-1.7	2.2 2.0-2.5	2.3 2.1-2.6	1.5 1.4-1.7	2 1.8-2.3	2.2 1.9-2.3
Mean Gradient mmHg	6 4-8	11 9-15	14 11-16	5 4-6	10 7-13	12 11-15	5 4-7	8 6-10	10 8-12
DPI (V2/LVOT velocity)	0.68 .55-.81	0.51 .40-.56	0.39 .33-.44	0.68 .69-.75	0.5 .44-.58	0.42 .36-.47	0.65 .54-.73	0.52 .48-.59	0.43 .39-.50
EOA cm2	2.7 2.2-3.1	1.7 1.6-1.9	1.6 1.5-1.9	3.2 2.9-3.5	2.2 1.9-2.5	2.1 1.8-2.3	3.5 2.7-4.0	2.5 2.1-2.8	2.6 2.1-3
EOA/BSA cm2/m2	1.4 1.3-1.7	1.1 1.0-1.2	1 0.8-1.1	1.6 1.5-1.8	1.2 1.0-1.4	1.1 0.9-1.3	1.8 1.4-2.0	1.4 1.1-1.5	1.3 1.0-1.5

Valvular Heart Disease